

Site Specific Sampling Plan

Avery Landing Site
Avery, Idaho

for

**U.S. Environmental Protection Agency on Behalf
of Potlatch Land and Lumber, LLC**

April 12, 2013



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**Site Specific Sampling Plan
Avery Landing Site
Avery, Idaho**

File No. 2315-016-02

April 12, 2013

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1.0 INTRODUCTION

This document presents a Site Specific Sampling Plan (SSSP) for the environmental sampling activities to be completed as part of the Avery Landing Site (Site) removal action. The Site is located approximately one mile west of Avery, Idaho (Figure B-1). This SSSP is to be used in conjunction with the Site Quality Assurance Project Plan (QAPP) which is presented in Appendix C of the Avery Landing Removal Action Work Plan (Work Plan; GeoEngineers, 2013). The information contained in this SSSP is based on information available at the time of preparation. This SSSP may be updated as additional information becomes available.

The SSSP and associated QAPP were prepared in general accordance with the requirements of 40 CFR 300.415(b)(4)(ii), EPA's Requirements for Quality Assurance Project Plans (EPA, 2001) and EPA's Guidance for Quality Assurance Project Plans (EPA, 2002).

2.0 PROJECT MANAGEMENT AND ORGANIZATION

The project management and organization elements of the SSSP, as detailed below, address the basic area of project management including the project history, team objectives, roles and responsibilities of the participants. This element of the plan ensures that the project has a defined goal, and that all participants understand this goal and that the planning outputs have been documented.

2.1. PERSONNEL AND ROLES INVOLVED IN THE PROJECT

Key individuals and positions providing quality assurance (QA) and quality control (QC), including a description of the responsibilities, lines of authority and communication for the key individuals and positions providing QA and QC, is presented in the QAPP (Appendix C of the Work Plan).

PHYSICAL DESCRIPTION AND SITE CONTACT INFORMATION

Site Name	Avery Landing Site
Site Location	The Site is located approximately one mile west of Avery, Idaho, on the north side of the St. Joe River. The Site is located in the NW quarter of Section 16, Township 45 North, Range 5 East, Willamette Meridian, and is located at latitude 47 ° 13' 57" North and longitude is 115 ° 43' 40" West.
Property Size	Approximately 6 acres
Site Regulatory Contact	Earl Liverman, EPA On-Scene Coordinator
Nearest Residents	The eastern portion of the Site includes the Bencik property, a seasonally occupied residence.
Primary Land Uses Surrounding the Site	North: Highway 50 ("St. Joe River Road"), owned by the Federal Highway Administration (FWHA). South: St. Joe River (rural/recreational) East: Rural/recreational West: Rural/recreational

2.2. SCHEDULE OF WORK

Removal action activities being performed by Potlatch Land and Lumber, LLC (Potlatch) will be completed summer/fall of 2013. Post-removal action groundwater monitoring will be completed following completion of the removal action as approved by EPA. A schedule for mobilization/demobilization, removal action activities, and reporting are presented in the Work Plan.

2.3. HISTORICAL AND BACKGROUND INFORMATION

Detailed information regarding Site and operational history, previous investigations and regulatory history and cleanup actions are presented in EPA's EE/CA (E&E, 2010) and/or Potlatch's Supplemental Investigation Report (GeoEngineers, 2011) and areis summarized in the Work Plan.

2.4. CONCEPTUAL SITE MODEL

Detailed information regarding the Conceptual Site Model is presented in EPA's EE/CA (E&E, 2010) and Potlatch's Supplemental Investigation Report (GeoEngineers, 2011). The nature and extent of contamination, sensitive species and environment, and cultural resources are summarized in the Work Plan.

2.5. DECISION STATEMENT

Decision Statements define the purpose and use of environmental data and serve as the basis for important decisions regarding key design features such as determining the end use of materials generated, response actions to be taken and/or the number and location of samples to be collected and the analyses to be performed.

2.5.1. Soil Excavation

2.5.1.1. OVERBURDEN SOIL

Decisions to be made during excavation of overburden soil are to:

- Confirm through field screening that overburden material meet the reuse criteria.
- Determine if the overburden soil used for backfill meets the compaction criteria following placement.

2.5.1.2. CONTAMINATED SOIL

Decisions to be made during excavation of contaminated soil are to:

- Determine if concentrations of contaminants in soil generated by the removal action meets landfill disposal criteria.

2.5.1.3. FINAL EXCAVATION LIMIT

Decisions to be made when the removal action is at the final excavation limit are to:

- Determine the vertical and lateral extent of petroleum contaminated soil within the removal action area.
- Determine the concentrations of petroleum hydrocarbons (TPH), VOCs, SVOCs, and PCBs ~~and~~ metals in soil at the final excavation limit.

Commented [EL1]: Revise to include a decision statement and other requirements for completion sampling for those areas previously sampled by EPA such as the surface where the contaminated soil stockpiles and certain roadways, and for baseline and completion sampling for newly constructed features such as the excavation water detention area and the construction staging area.

Commented [PL2]: Added text for sampling of areas used for temporary facilities (i.e., staging area, water treatment area, temporary haul roads, and soil staging pads) to this and the following sections.

2.5.2. Imported Fill Material

Decisions to be made for imported fill material are to:

- Determine the concentrations of ~~TPH, SVOCs, VOCs, and PCBs and RCRA metals~~ in imported fill.
- Determine the maximum dry density of imported fill material to confirm material is acceptable for placement.
- Determine if the imported fill material used for backfill meets the compaction criteria following placement.

2.5.3. Surface Water

- Determine surface water quality parameters to determine if the removal action is affecting surface water adjacent to the Site.

2.5.4. Water Treatment System

- Determine the effectiveness of the on-site treatment system in meeting surface water discharge criteria prior to discharging any water. Only analytes previously detected in groundwater at concentrations exceeding surface water quality parameters will be evaluated (see Table 1 of the Work Plan).
- Determine if treated water generated during removal action meet the surface water discharge criteria.
- Determine if the primary granular activated carbon (GAC) vessel in the water treatment system are close to achieving breakthrough.
- Determine the chemical composition of product recovered by the water treatment system to determine the appropriate disposal facility.

2.5.5. Air

- Determine if dust/particulate generated by the removal action are being transported beyond the project boundary.

2.5.6. Groundwater

- Determine the concentrations of ~~petroleum hydrocarbons (TPH), VOCs, SVOCs, and PCBs and metals~~ in groundwater following completion of the removal action and monitor natural attenuation of Site contaminants.

2.5.7. Temporary Facilities

Temporary facilities include the construction staging, water treatment, temporary haul road, temporary overburden soil stockpile and soil staging pad areas. Decisions to be made for these areas are to:

- Determine if the removal action has contributed additional contamination to areas utilized for establishment of temporary construction facilities.

2.6. ACTION LEVELS

Site action levels for the soil excavation, surface water monitoring, water treatment system monitoring, and air monitoring activities are presented in Table B-1. Water treatment system effluent discharge limits are presented in Table B-2. Import fill material criteria are presented in Table B-3.

3.0 DATA ACQUISITION AND MEASUREMENT OBJECTIVES

3.1. SITE DIAGRAM AND SAMPLING AREA

A Sampling Area is an area of the project in which a specific action will be performed to address the Decision Statements presented in Section 2.6. Figure B-1 shows the location of the Site and surrounding features. Figure B-2 shows the general Site layout, excavation areas and maximum expected limits of excavation based on the existing information, water treatment area and project boundary as well as upstream and downstream water quality sampling locations, and anticipated excavation limit sampling locations. Figure B-3 shown the general water treatment system layout and anticipated sampling locations during system startup. Figure B-4 shown the general water treatment system layout and anticipated sampling locations during normal system operation. The final excavation limits will be determined by EPA.

Sampling areas for the soil excavation and material generated by the soil excavation, imported fill material, water treatment system, and associated product, air, surface water, and post-removal action groundwater are summarized in the following sections.

3.1.1. Soil Excavation

3.1.1.1. OVERBURDEN SOIL

Overburden soil overlying petroleum contaminated soil is a sampling area. This sampling area will be field screened for the presence of free-phase petroleum hydrocarbons, oil-staining, sheen exceeding field screening criteria, and field measured organic vapor during excavation. Field screening methods are described in the QAPP. Action Levels based on field screening results are presented in Table B-1. The approximate extent of the expected excavation limits is shown on Figure B-2. Based on the results of previous environmental investigations and experience gained by EPA as part of the 2012 removal action, the overburden/contaminated soil contact at the Site maybe as shallow as 2 feet below ground surface (bgs).

3.1.1.2. CONTAMINATED SOIL

Excavation activities to remove the underlying contaminated soil is a sampling area and will extend laterally and vertically until field screening evidence of petroleum contamination is no longer observed. Contaminated soil generated by the removal action will be stockpiled on Site and allowed to dewater until a representative soil sample from the stockpile passes a Paint Filter Liquids Test (PFLT; EPA Method 9095). If required by the receiving landfill, representative soil samples will be obtained from stockpiled contaminated soil at a frequency determined by the landfill and submitted for chemical analysis and that may include SVOCs, VOCs, PCBs, TCLP and/or RCRA metals.

Commented [EL3]: Revise the labeling of the "stockpile bunker" to match the Work Plan labeling "Soil Staging Pad."

Commented [PL4]: Figure B-2 has been revised.

Commented [SH5]: Note that Figure B-2 and Table 1 only shows five of the baseline composite sample locations. The sixth one, which was on the eastern part of the Bentick property, is not shown (the figure doesn't extend that far to the east).

If they will not perform any site actions at that portion of the site, maybe not including is OK?

Also, should there be post-removal surface sampling in the backfilled/re-graded area of EPA's excavation area, if they will be doing any activity there?

Commented [EL6]: EPA included use of a PID as one of several field screening methods. Additionally, the action level was listed as "above background."

Commented [PL7]: Section 3.2.4 of the QAPP details field screening methods including the use of a PID. Due to the many variables that may affect the quality of head space vapor measurements (i.e., relative humidity, soil type, organic content, moisture content, daily temperature variation, etc.) may result in elevated or erratic readings. In response to this comment, the action level will be modified to from 20 ppm to 5 ppm above background which allows for potential measurement error due to the effects of soil type, moisture content and other variables.

3.1.1.3. FINAL EXCAVATION LIMIT

Following confirmation of the final excavation limits passing sidewall and base field screening results, soil samples will be obtained from the ~~sidewalls~~ and base of the final excavation limit to determine final Site conditions and to determine baseline concentrations for natural attenuation monitoring. ~~Potlatch will use discretion with respect to collection of sidewall samples will be collected from the transitions between the Potlatch property and FHWA properties, Potlatch and IDL properties, or Potlatch and Bencik properties since the sidewall is comprised of clean backfill material placed by EPA. Sidewall samples will be collected from these transitions to confirm any areas suspected to have been re-contaminated as part of the transition area construction.~~

The approximate extent of the expected excavation limits are shown on Figure B-2. Based on the results of previous environmental investigations and experience gained by EPA as part of the 2012 removal action, petroleum hydrocarbon contaminated soil at the Site maybe as shallow as 2 feet bgs and could extend as deep as approximately 20 feet bgs.

3.1.2. Imported Fill Material

The source material for imported fill is a sampling area. ~~Representative soil~~ ~~S~~amples of the source material for imported fill soil will be collected and submitted to a chemical analytical laboratory to determine if the source material meets the chemical analytical criteria for use at the Site (Table B-3).

The imported fill material used for backfill is also a sampling area and will be tested to confirm adequate compaction following placement. ~~Soil Representative~~ samples will be obtained from the source material and submitted for laboratory analysis to determine the materials maximum dry density.

3.1.3. Surface Water

Surface water upstream, ~~and mid-Site and downstream~~ of the Site on the St. Joe River are sampling areas. Surface water monitoring will be conducted at locations upstream and downstream of the removal action area to determine if Site activities are adversely affecting surface water quality in the St. Joe River. ~~A mid-Site location will be determined in the field based on the actual location of the water treatment system and discharge point and will be used to assess the potential impacts to surface water quality from the discharge of the treated water.~~

3.1.4. Water Treatment System

The ~~influent and effluent water to the locations of the on-Site~~ water treatment system are sampling locations. Influent and effluent water samples will be collected for chemical analysis during system startup and operation to evaluate the performance of the treatment system and ensure that contaminants of concern are not being discharged to the St. Joe River exceeding discharge limits (Table B-2).

~~In addition, water collected from between the primary and secondary GAC vessels in the water treatment system is a at the effluent sampling location. WaterThese~~ samples will be collected ~~between the primary and secondary GAC vessels during treatment system normal operation to evaluate potential contaminant breakthrough.~~

Commented [EL8]: The clean transition area sidewalls need not be sampled. See also Work Plan Section 4.7.1.

Commented [PL9]: See added text below in the following sentence.

Commented [EL10]: Identify the influent sampling location.

Commented [PL11]: Figure 3 (new) shows water treatment sampling locations.

Commented [EL12]: EPA did not analyze for the mercury, TPH (diesel- and heavy-oil range), or benzo(k)fluoranthene.

Commented [PL13]: TPH has been removed from the list of analysis. Both benzo(k)fluoranthene and mercury were detected in groundwater at concentrations exceeding surface water quality criteria. Potlatch will sample treated water for all contaminants that detected in groundwater that exceeded the surface water quality criteria as indicated by Table 1 of the Work Plan.

Commented [SH14]: IDAPA 58.01.02 doesn't list a human health surface water screening level for mercury, as indicated in Table 1 of the work plan. However, Table B-2 has a value of 0.012 ug/L for mercury. Where did they get this value, why are the tables inconsistent, and should they use it?

Commented [EL15]: The discharge limit for chrysene is 0.0038 µg/L.

Commented [PL16]: Discharge limit for chrysene corrected in Table B-2.

Commented [PL17]: Water sample at this location is to evaluate breakthrough and is not considered an "effluent" water sample.

Commented [EL18]: Describe sampling during water treatment system startup.

Commented [PL19]: Sampling during system startup is detailed in Section 3.4.5 as indicated by the following paragraph.

The temporary water treatment system has been designed to treat contaminants previously detected in groundwater at concentrations exceeding Idaho surface water quality criteria (Idaho Administrative Code [IAC] 58.01.02). Table 1 of the Work Plan presents a summary of analytes detected in groundwater at the Site and corresponding maximum detected concentrations. Initial system startup testing and operational testing are described in Section 3.4.5. Influent, effluent and contaminant breakthrough sampling locations for setup testing and operational testing are shown on Figures B-3 and B-4, respectively.

3.1.5. Air

Air at the Site and in the nearby vicinity of the Site is a sampling area. Air monitoring for particulate matter will be conducted at locations upwind, mid-Site and downwind using field instruments to determine if Site activities are generating particulate concentrations that exceed action levels (Table B-1) at the project boundary.

3.1.6. Groundwater

Groundwater at the Site is a sampling area. New groundwater wells will be installed following removal action and groundwater samples will be obtained following completion of the removal action to monitor natural attenuation of Site contaminants. A Natural Attenuation Performance Groundwater Monitoring Plan identifying analytes, sSampling locations, frequency, and duration will be prepareddetermined following completion of the removal action and will be submitted to in consultation with EPA for review and approval.

3.1.7. Temporary Facilities

Temporary facilities, including the construction staging area, water treatment area, temporary haul roads, temporary overburden soil stockpile, and soil staging pads are sampling areas. During the 2012 EPA removal action, composite and discrete soil samples were obtained within portions of Potlatch's property to document pre-use conditions. These sampling areas/locations are shown on Figure B-2. Chemical analytical results from EPA's baseline sampling activities are summarized in Table B-4.

Prior to the start of the Potlatch removal action, baseline samples will be obtained from composite sampling areas BLO4 and BLO5 and discrete sampling locations BL10V-BLO4V and BL11V-BLO5V to represent pre-use soil conditions in the portion of the property that may be utilized for construction staging overburden soil stockpiles, water treatment, and/or temporary roads. Baseline samples will not be obtained in the portions of the property occupied by the soil staging pads since the ground surface beneath these pads is inaccessible. Additionally, baseline samples will not be obtained from areas of the property that will be excavated as part of the Potlatch removal action. Following completion of the removal action, composite sampling areas BLO1 through BLO5 and discrete sampling locations BL07V-BLO1V through BL11V-BLO5V will be re-sampled to evaluated post-use conditions.

Post-use sample results will be compared to pre-use sample results to determine if Site activities have contributed additional contamination at these locations. The approximate locations of the soil staging pads, temporary haul roads, construction staging and water treatment areas as well as

Commented [SH20]: Updated to match the sample designations in the EPA report.

the approximate composite sampling areas, and discrete sampling locations for EPA's 2012 removal action are shown on Figure B-2.

3.2. DECISION RULES

Decision Rules are statements that describe how the decisions will be made and how to address results exceeding action levels established for the project. Decision rules for the removal action are summarized in the following sections.

3.2.1. Soil Excavation

3.2.1.1. OVERBURDEN SOIL

If soil indicates the presence of free-phase petroleum hydrocarbons, oil-staining, sheen exceeding the field screening criteria, or elevated field measured organic vapor during excavation activities, then the soil will be segregated, stockpiled and treated as contaminated (see Section 3.2.1.2). If soil generated during excavation activities to remove overburden material does not yield field screening evidence of petroleum contamination, then the material will be stockpiled on Site pending reuse as excavation backfill.

Overburden material used for backfill will be placed in the excavations using 24-inch lifts or less and will be compacted with equipment suitable for the soil type. If field density tests of the compacted overburden material used is below the minimum compaction requirements, additional compaction will occur until the density meets the minimum compaction criteria (Table B-1).

3.2.1.2. CONTAMINATED SOIL

If field screening results indicate the presence of petroleum contamination, then material represented by these field screening results will be transferred from the Site to a permitted landfill. Contaminated soil generated within the saturated zone will be stockpiled on-Site and allowed to dewater until representative stockpile samples passes the PFLT. If representative samples of the stockpiled contaminated soil fail the PFLT, then the stockpile will be allowed to dewater further until representative stockpile samples passes the PFLT.

If requested by the receiving landfill, representative samples will be obtained for chemical analysis for soil disposal profiling. Sample results will be submitted to the landfill prior to transport to ensure that the material is acceptable for disposal.

If batteries, leaky underground storage tanks (LUSTs), drums, etc. are encountered during excavation, soil removed from these areas will be segregated and sampled-tested for TCLP, and/or PCBs or other required analysis to characterize the material for disposal. If asbestos containing material is encountered (i.e., asbestos cement pipes), this material will be abated following federal guidelines and determine whether the material designates as a dangerous waste. Dangerous waste will be transferred to a landfill permitted to receive such material.

3.2.1.3. FINAL EXCAVATION LIMIT

EPA will determine the final excavation limit. If soil at the estimated excavation limit indicates field screening evidence of petroleum contamination, then excavation activities will continue laterally until field screening evidence of contamination is no longer observed; and vertically until field

Commented [EL21]: Table B-1 mistakenly lists ASTM D2942 for in-place density and water content of soil; the correct test method is ASTM D6938.

Commented [PL22]: ASTM reference corrected in Table B-1.

Commented [EL23]: Dependent on what is found, sampling and analysis may not be necessary (e.g., asbestos cement pipe) or other analysis may be required.

Commented [PL24]: Revised text to include asbestos pipe and to not limit the testing requirements of the receiving facility.

screening evidence of petroleum contamination is no longer observed or to a maximum depth of approximately two feet below the seasonal low groundwater level of 17 feet bgs.

3.2.2. Imported Fill Material

If ~~representative~~ soil samples of the import fill material source exceed the chemical analytical criteria presented in Table B-3, then the import fill material source will not be used and additional sources of import fill material evaluated.

Import fill material used for backfill will be placed in the excavations using 24-inch lifts or less and will be compacted with equipment suitable for the soil type. If field density tests of the compacted fill material used is below the minimum compaction requirements, additional compaction will occur until the density meets the minimum compaction criteria (Table B-1).

3.2.3. Surface Water

If downstream surface water quality parameters exceed the action levels presented in Table B-1, additional Best Management Practices (BMPs) will be implanted to correct the action level exceedance or until no additional project activity modification is possible.

3.2.4. Water Treatment System

If effluent water sample results during system startup (before any water is discharged) exceed the surface water discharge criteria presented in Table B-2, then the water represented by this sample will be rerouted through the treatment system and/or the treatment system will be modified to improve efficiency until acceptable water sample results are achieved. If sample results during system startup (before any water is discharged) are below the limits presented in Table B-2, then ~~the~~ treatment system will be considered operational and the treated water will be ~~allowed to~~ discharged to the St. Joe River ~~and/or will be reused on-Site~~.

If effluent water sample results from the water treatment system during the removal action exceed the surface water discharge criteria presented in Table B-2, then the discharge of treated water to the St. Joe River will be suspended and batched treated water rerouted through the treatment system until acceptable water sample results are achieved. If sample results from the water treatment system during the removal action are below the limits presented in Table B-2, then the water will be ~~allowed to~~ discharged to the St. Joe River ~~and/or will be reused on-Site~~.

If water samples from the water treatment system obtained from between the primary and secondary GAC vessels have detections of SVOCs or petroleum hydrocarbons that exceed the surface water discharge criteria presented in Table B-2, the primary GAC vessel will be replaced or GAC will be replaced with new material.

If product is obtained from the water treatment system, the product will be skimmed off, stored on Site in 55-gallon drums, laboratory analysis conducted as required by an appropriate disposal facility and disposed of separately from the treated water.

Commented [EL25]: EPA did not have backfill acceptance criteria; rather backfill sampling was performed for the purpose of characterization only.

Commented [PL26]: EPA's Draft Final Work Plan indicates a screening level of background (i.e., PQL) for imported material. The criteria presented in Table B-3 is the lowest obtainable analytical detection level (PQL) or Human Health Assessment Soil Screening levels referenced from the EECA.

Commented [SH27]: Earl, I'd like to discuss this one. Our SSSP does refer to background for baseline samples, but we do not define background as these HH screening levels.

3.2.5. Air

If the air particulate concentration at the project boundary exceed the action levels presented in Table B-1, additional BMPs will be implanted to control dust (i.e., suspending excavation activities, soil wetting, etc.) until the air monitoring results are below the action levels.

3.2.6. Groundwater

~~Existing Site groundwater monitoring wells and groundwater monitoring wells installed following completion of the removal action (see Section 3.4.6) Monitoring wells will be installed and groundwater~~ will be sampled to monitor post-removal action groundwater conditions and natural attenuation of Site contaminants. Sampling locations, frequency and duration will be determined following completion of the removal action ~~and will be submitted to EPA for review and approval in consultation with EPA.~~

Commented [EL28]: Existing well(s) will also be a part of the network. See comment below.

Commented [PL29]: Revised text in make use of existing wells, if remaining, for post-construction groundwater monitoring.

3.2.7. Temporary Facilities

~~If samples representing post-use conditions indicate that the Site activities have not contributed to additional contamination at these locations, then no additional action will be taken. If post-use samples indicated that the Site activities have contributed to additional contamination at these locations, then soil represented by these samples will be removed from the property and the newly exposed surface re-sampled to confirm removal of the impacted material.~~

3.3. INFORMATION NEEDED FOR THE DECISION RULES

Parameters/analytes for the surface water monitoring, water treatment system monitoring, and air monitoring activities are presented in Table B-1. Water treatment system effluent discharge parameters and limits are presented in Table B-2. Import fill material analytical criteria are presented in Table B-3. The information needed to apply the decision rules are described in the following sections.

3.3.1. Soil Excavation

3.3.1.1. OVERBURDEN SOIL

- Field screening results for the presence of free-phase petroleum hydrocarbons, oil staining, sheen exceeding field screening criteria, or elevated field measured organic vapor.
- Soil compaction results for backfilled overburden material.

3.3.1.2. CONTAMINATED SOIL

- Results of soil samples of stockpiled contaminated soil analyzed for PFLT.
- If required by the receiving landfill, stockpiled contaminated soil will be sampled for chemical analysis.

3.3.1.3. FINAL EXCAVATION LIMIT

- Field screening results for the presence of free-phase petroleum hydrocarbons, oil staining, sheen exceeding field screening criteria, or elevated field measured organic vapor.
- Soil samples results taken from the final excavation limits submitted for laboratory analysis of TPH, VOCs, SVOCs, ~~and PCBs and metals.~~

Commented [EL30]: EPA did not analyze for metals.

Commented [PL31]: Removed to match EPA.

3.3.2. Imported Fill Material

- Soil samples of import fill material for chemical analysis.
- Results of maximum dry density testing for ~~representative~~ soil samples of imported fill material.
- Soil compaction results for backfilled imported fill material.

3.3.3. Surface Water

- Surface water quality parameters at upstream, mid-Site and downstream locations.

3.3.4. Water Treatment System

- Water treatment system influent and effluent sample results for chemical analysis during system startup.
- Water treatment system influent and effluent sample results for chemical analysis during removal action.
- Water treatment system sample results between the primary and secondary GAC vessels for chemical analysis during removal action.
- If required by the receiving facility, product samples will be sampled for chemical analysis.

3.3.5. Air

- Air particulate concentrations at the upwind, mid-Site and downwind project boundary locations.

3.3.6. Groundwater

- Water samples to monitor groundwater conditions and natural attenuation of Site contaminants.

3.3.7. Temporary facilities

- Field screening results for the presence of free-phase petroleum hydrocarbons, oil staining, sheen exceeding field screening criteria, or elevated field measured organic vapor.
- Composite soil samples results taken from areas of the property utilized for temporary roads, construction staging, soil staging, and water treatment submitted for laboratory analysis of TPH, SVOCs, and PCBs.
- Discrete soil samples results taken from areas of the property utilized for temporary roads, construction staging, soil staging, and water treatment submitted for laboratory analysis of VOCs.

3.4. SAMPLING AND ANALYSIS

Sampling and analysis protocols are described in greater detail in the QAPP. Field procedures including field screening, soil sample collection and field documentation as well as data quality objectives for chemical analysis are presented in the QAPP.

3.4.1. Soil Excavation

3.4.1.1. OVERBURDEN SOIL

The ~~primary method for determining petroleum contaminated soil will be through~~ water sheen testing, ~~including t-although~~ the presence of free-phase petroleum hydrocarbons, oil-staining or elevated field measured organic vapor ~~may also will be used for determining petroleum contaminated soil depending on field conditions.~~ The procedure for water sheen testing will consist of collecting approximately 50 grams of ~~representative~~ soil at the selected locations within a sheen pan containing water. Samples that exhibits rainbow sheen (definite oil sheen, film or product that displays rainbow) will be considered contaminated. A passing test will be defined as soil that does not exhibit a rainbow sheen. If a rainbow sheen is observed in a sample, or if free-phase petroleum hydrocarbons, oil-staining or elevated field measured organic vapor using a photoionization detector (PID) is noted, then soil represented by this sample will be segregated and stockpiled on Site pending transport to a permitted landfill.

Overburden soil in which the presence of free-phase petroleum hydrocarbons, oil-staining, sheen exceeding field screening criteria, or elevated field measured organic vapor is not observed will be stockpiled on Site for reuse as backfill material.

Overburden soil material will be placed in the excavation using 24-inch lifts or less and will be compacted with equipment suitable for the soil type with the goal of reaching 90 percent of the maximum dry density. Stones will not be allowed to form clusters with voids. When backfill material is too dry for adequate compaction, water shall be added to the extent necessary to achieve compaction.

3.4.1.2. CONTAMINATED SOIL

Soil in which exhibits the presence of free-phase petroleum hydrocarbons, oil-staining, sheen exceeding field screening criteria, or elevated field measured organic vapor will be considered contaminated and will be transferred to a permitted landfill for disposal. Petroleum contaminated soil generated from the saturated zone will be allowed to drain until a ~~representative~~ samples from the pile passes the PFLT.

If requested by the receiving landfill, ~~representative~~ soil samples will be obtained at the frequency determined by the receiving landfill, and submitted to a contracted ~~off-Site~~ laboratory with a quick turnaround time for one or more of the following chemical analyses:

- VOCs by EPA Method 8260;
- SVOCs by EPA Method 8270/SIM;
- PCBs by EPA Method 8082;
- RCRA metals including arsenic, barium, cadmium, chromium, lead, mercury, selenium and silver by EPA Method 6000/7000 series; and/or
- TCLP by EPA Method 1311.

3.4.1.3. FINAL EXCAVATION LIMIT

Soil samples will be obtained from the base of the final excavation limit on a grid pattern with grid cells measuring approximately 150 feet (along the plume length) by approximately 100 feet (along

Commented [EL32]: EPA did not use sheen testing as the primary method for determining petroleum contaminated soil. The extent of excavation was determined based on field observations, including presence of free-phase petroleum hydrocarbons, oil-stained soil, visible oil sheen, petroleum odor, petroleum sheen testing, and/or field organic vapor monitoring.

Commented [PL33]: Revised text.

Commented [SH34]: Maybe it's a quibble, but technically I wouldn't say that the items included in the "including" phrase are subsets of "Water sheen testing." It would be more accurate to say something like "Field observations, including water sheen testing, oil staining..., etc."

the plume width). For the excavation sidewalls, one soil sample will be collected approximately every 300 horizontal feet of sidewall at a depth either similar to the documented presence of Site contaminants or at the approximate midpoint between the base of the excavation and the ground surface. The anticipated locations for base and sidewall samples based on the maximum expected limits of excavation are shown on Figure B-2.

Samples will be direct grab samples, or, depending on stability of the excavation and access to the selected sample location, may be collected from the bucket of the backhoe performing the excavation. Samples will be collected at a depth of approximately 2 to 6 inches into the exposed surface and containerized as specified by the laboratory with the sample location, date, time and depth documented. Soil samples will be placed in placed on ice for transport to the analytical laboratory. Soil samples will be submitted to a ~~contracted off-Site chemical analytical~~ laboratory for the following chemical analyses:

- Diesel- and heavy oil-range petroleum hydrocarbons by Ecology Method NWTPH-Dx;
- VOCs by EPA Method 8260;
- SVOCs by EPA Method 8270/SIM; and
- ~~PCBs by EPA Method 8082; and,~~
- ~~Metals including antimony, arsenic, barium, beryllium, cobalt, iron, lead, manganese and mercury by EPA Method 6000/7000 series.~~

3.4.2. Imported Fill Material

~~Representative One composite~~ soil samples will be obtained from each source that will be used for importing fill material. For example, if material is received from the County or USFS, each discrete source area where material may be taken from will be sampled. A composite~~A representative~~ soil sample of the source material will be obtained ~~from the imported fill material source~~ to determine the maximum dry density using a modified proctor test by ASTM method D1557. In addition, a ~~representative composite~~ soil sample will also be submitted to a ~~contracted off-Site chemical analytical~~ laboratory with a quick turnaround time for the following chemical analyses:

- Diesel- and heavy oil-range petroleum hydrocarbons by Ecology Method NWTPH-Dx;
- VOCs by EPA Method 8260;
- SVOCs by EPA Method 8270/SIM; and
- PCBs by EPA Method 8082; and
- ~~RCRA metals including arsenic, barium, cadmium, chromium, lead, mercury, selenium and silver by EPA Method 6000/7000 series;~~

Fill material will be placed in the excavation using 24-inch lifts or less and will be compacted with equipment suitable for the soil type. At least one field density test for approximately every three lifts will be taken using ASTM Method ~~D6938~~2942 (nuclear density gauge). Stones will not be allowed to form clusters with voids. When backfill material is too dry for adequate compaction, water shall be added to the extent necessary to achieve 90 percent compaction relative to the maximum density.

Commented [SH35]: delete

Commented [EL36]: Clarify the meaning of source. For example, if material is received from the County, is source each discrete area where material may be taken from or does source apply to County material in as a whole.

Commented [PL37]: Revised text to clarify.

Commented [EL38]: EPA did not analyze for metals, but TPH (diesel- and heavy-oil range) was analyzed for.

Commented [PL39]: Revised analysis to match EPA.

3.4.3. Surface ~~water~~ ~~Water~~

Field measurements of pH, electric conductivity, turbidity, dissolved oxygen and temperature will be obtained on a ~~weekly~~daily basis during excavation, ~~and/or~~ active waste water discharge, and ~~on a daily basis~~ during shoreline excavation activities. Field parameters will be measured from grab samples collected from the anticipated upstream and downstream sampling locations shown on Figure B-2. A mid-Site sampling location will be determined in the field based on the actual location of the water treatment system. A Hanna Instruments multi-parameter meter or similar will be used for documenting pH, electric conductivity, dissolved oxygen and temperature. A Lamotte turbidimeter or similar will be used to document turbidity. Procedures for measuring field parameters will be in general accordance with the manufacturer's instructions.

3.4.4. Air

Daily ~~targeted~~ air monitoring samples will be collected at the project boundary during excavation activities ~~for particulate matter at upwind and downwind locations~~ using an AeroTrak Handheld Particle Counter or similar. Prior to the start of Site work, an upwind (or background) reading will be measured. During Site work, periodic readings will be collected throughout the day (saving data to a data logger or documented in daily field records) mid-Site and downwind of the work area. Procedures for measuring field parameters will be in general accordance with the manufacturer's instructions.

3.4.5. Excavation Water Treatment and Associated Product

3.4.5.1. STARTUP TESTING

Influent and effluent water samples will be obtained from water treatment system during ~~initial~~ system startup at locations shown on Figure B-3. ~~Representative g~~Grab samples will be obtained from water entering the treatment system (pre-treatment/influent sample) and from water exiting the treatment system (post-treatment/effluent sample) through inline sampling ports in approximately 10,000 gallons batches until a total of 50,000 gallons of water has been processed. Influent and effluent samples will be submitted to a ~~contracted off-Site chemical analytical~~ laboratory with a quick turnaround for the following:

- ~~Diesel and heavy oil range petroleum hydrocarbons by Ecology Method NWTPH-Dx;~~
- SVOCs including benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, bis[2-ethylhexyl]phthalate, chrysene, and n-nitrosodiphenylamine by EPA Method 8270/SIM;
- PCBs by EPA Method 8082; and
- Metals including arsenic, cadmium, copper, lead, mercury, thallium, and zinc by EPA Method 200.7/200.8/7470A/7471B.

3.4.5.2. OPERATIONAL TESTING

Influent and effluent samples will be obtained at locations shown on Figure B-4 on a weekly basis during operation to monitor the discharge concentrations. Grab samples will be collected and submitted to a ~~contracted off-Site chemical analytical~~ laboratory with a quick turnaround for the following:

Commented [EL40]: Clarify whether the instrument will collect a single daily reading or periodic readings throughout the day (saving data to a data logger)?

Commented [PL41]: Revised text to clarify.

Commented [SH42]: It's interesting that they only plan to take one reading at the upwind location. What if the winds shift during the work day?

Commented [EL43]: EPA did not analyze for diesel- and heavy-oil range petroleum hydrocarbons by Ecology Method NWTPH-Dx.

Commented [PL44]: Removed TPH to match EPA.

Commented [EL45]: EPA did not analyze for benzo[k]fluoranthene.

Commented [PL46]: Both benzo(k)fluoranthene and mercury were detected in groundwater at concentrations exceeding surface water quality criteria. Potlatch will sample treated water for all contaminants that detected in groundwater that exceeded the surface water quality criteria as indicated by Table 1 of the Work Plan.

Commented [EL47]: EPA did not analyze for mercury.

Commented [PL48]: See comment above in Section 3.1.4.

Commented [SH49]: See previous comment about mercury.

~~Diesel- and heavy-oil-range-petroleum-hydrocarbons-by-Ecology-Method-NWTPH-Dx;~~

- SVOCs including benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, bis[2-ethylhexyl]phthalate, chrysene, and n-nitrosodiphenylamine by EPA Method 8270/SIM;
- PCBs by EPA Method 8082; and
- Metals including arsenic, cadmium, copper, lead, mercury, thallium, and zinc by EPA Method 200.7/200.8/7470A/7471B.

A water sample will also be obtained on a weekly basis between the primary and secondary GAC vessels (see Figure B-4) during operation to monitor contaminant breakthrough. Grab samples will be collected and submitted to a contracted off-Site chemical-analytical laboratory with a quick turnaround for the following:

~~Diesel- and heavy-oil-range-petroleum-hydrocarbons-by-Ecology-Method-NWTPH-Dx; and~~

- SVOCs including benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, bis[2-ethylhexyl]phthalate, chrysene, and n-nitrosodiphenylamine by EPA Method 8270/SIM.

The samples collected between the GAC vessels will only be analyzed for ~~these analytes-SVOCs~~ because it is expected that SVOCs will be the first contaminants to achieve breakthrough, ~~and petroleum hydrocarbons are the primary COC at the Site.~~

3.4.5.3. PRODUCT SAMPLES

~~Representative grab~~Grab sample(s) will be collected from the treated water system recovered product and analyzed for the parameters required by the disposal facility at a chemical analytical laboratory. The actual quantity of samples will be determined based on the volume of product collected and the requirements of the disposal facility.

3.4.6. Groundwater

Following completion of the removal action, an estimated 4 to 5 monitoring wells will be installed in and around the excavation area to evaluate groundwater conditions at the Site. Grab samples will be collected from these wells and one or more exiting monitoring wells following completion of the removal action. The frequency of monitoring will be developed in consultation with EPA. A Natural Attenuation Performance Groundwater Monitoring Plan identifying analytes, sampling locations, frequency, and duration will be prepared following completion of the removal action and will be submitted to EPA for review and approval. Collected grab samples will be submitted to a contracted off-Site chemical-analytical laboratory with a standard turnaround for the following:

- Diesel- and heavy oil-range petroleum hydrocarbons by Ecology Method NWTPH-Dx;
- VOCs by EPA Method 8260;
- SVOCs by EPA Method 8270/SIM; and
- PCBs by EPA Method 8082.

Commented [EL50]: One or more existing wells (e.g., upgradient EMW-01) will be included as part of the monitoring network.

Commented [PL51]: Revised text to include existing site wells.

Commented [SH52]: Maybe this is implied, but will the monitoring plan also indicate the proposed locations of the new monitoring wells, and which existing monitoring wells will be included in the monitoring program?

- ~~Metals including antimony, arsenic, barium, beryllium, cobalt, iron, lead, manganese and mercury by EPA Method 6000/7000 series.~~

Commented [SH53]: Earl, should we discuss this one?

3.4.7. Temporary Felicities

~~Soil samples will be obtained from the areas of the property that are utilized for temporary roads, construction staging, soil staging, and water treatment. Prior to the start of construction, soil samples will be from the approximate areas utilized by EPA during their 2012 removal action for stockpiling of overburden soil, construction staging and temporary roads (i.e., Composite Sampling Areas BLO4 and BLO5, and Discrete Sampling Locations BL1004V and BL1105V) for TPH, SVOC, PCB, and VOC analysis to represent pre-use conditions for the Potlatch removal action. At the completion of the removal action, soil samples will be obtained from Composite Sampling Areas BLO1 through BLO5, and Discrete Sampling Locations BLO71V through BL1105V to represent post-use conditions.~~

~~Composite samples will be submitted to a contracted off-Site laboratory with a standard turnaround for the following:~~

- ~~Diesel- and heavy oil-range petroleum hydrocarbons by Ecology Method NWTPH-Dx;~~
- ~~SVOCs by EPA Method 8270/SIM; and~~
- ~~PCBs by EPA Method 8082.~~

~~Discrete samples will be submitted to a chemical analytical laboratory with a standard turnaround for the following:~~

- ~~VOCs by EPA Method 8260.~~

4.0 APPLICABILITY OF THE DATA

4.1. DEFINITIVE DATA

Definitive data is analytical data of sufficient quality for final decision-making. The objectives, procedures, organization, and specific quality assurance (QA) and quality control (QC) activities designed to achieve definitive data for the project is presented in the QAPP.

All chemical analytical data provided by fixed laboratories will be considered definitive data for the following:

- Final excavation limit soil samples;
- Stockpile soil samples;
- Imported fill material soil samples;
- Water treatment system influent and effluent water samples;
- Water treatment system water samples between the primary and secondary GAC vessels;
- Post-removal action groundwater samples; ~~and~~
- ~~Pre- and post-use soil characterization samples.~~

4.1.1. Screening Data with Definitive Confirmation

Screening data with definitive confirmation is analytical data that may be used to support preliminary or intermediate decision-making until confirmed by definitive data. Screening data with definitive confirmation will not be collected for the removal action.

4.1.2. Screening Data

Screening data is analytical data which has not been confirmed by definitive data. This data can be used for making decisions: 1) in emergencies, 2) for health and safety screening, 3) to supplement other analytical data, 4) to determine where to collect samples, 5) for waste profiling, and 6) for preliminary identification of pollutants. However, this data is not of sufficient quality for final decision making.

All data obtained from field instruments and/or visual observations will be considered screening data. Field instrument will be used for measuring surface water quality parameters, air particulate matter and soil density. Field screening methods, including water sheen screening, visual observations and headspace vapor measurements using a PID will be used to evaluate the presence of petroleum contamination (i.e., free-phase petroleum hydrocarbons, oil-staining, sheen, or field measured organic vapor).

4.2. SPECIAL SAMPLING OR ANALYSIS DIRECTIONS

Special sampling and analysis methods are described in the QAPP.

4.3. METHOD REQUIREMENTS

The goal of the analytical methods is to achieve practical quantitation limits (PQLs) lower than the Site screening levels. However, commercially available laboratory analyses may not be able to achieve PQLs for all chemicals that are lower than screening levels. If commercially available laboratory analyses are not be able to achieve a PQL lower than the screening level for a specific chemical, then the PQL will become the screening level.

4.4. SAMPLE COLLECTION INFORMATION

Sample collection procedures to be utilized as part of this investigation including field documentation, sample labeling, packaging and shipment, and sampling equipment maintenance, calibration and decontamination are presented in the QAPP.

Standard operating procedures (SOPs) for sampling and analytical protocols will be followed general accordance "Environmental Response Team Standard Operating Procedures," OSWER Directive Numbers 9360.4-02 through 9360.4-08 (ERT, 1991). Applicable SOPs or methods for the Avery Landing removal action include:

- SOP No. 2001 – General Field Sampling Guidelines
- SOP No. 2002 – Sample Documentation
- SOP No. 2003 – Sample Storage, Preservation and Handling
- SOP No. 2004 – Sample Packaging and Shipping

■ [SOP No. 2005 – Quality Assurance/Quality Control Samples](#)

■ [SOP No. 2006 – Sample Equipment Decontamination](#)

■ [SOP No. 2007 – Groundwater Well Sampling](#)

■ [SOP No. 2008 – Air Sampling](#)

■ [SOP No. 2012 – Soil Sampling](#)

■ [SOP No. 2013 – Surface Water Sampling](#)

■ [SOP No. 2043 – Manual Water Level Measurement](#)

■ [SOP No. 2044 – Monitoring Well Development](#)

■ [SOP No. 2048 – Monitoring Well Installation](#)

[Quick Start Guides and/or Manufactures Instructions will serve as SOPs for field instruments \(e.g., air monitoring equipment, PID, and/or surface water monitoring equipment\).](#)

5.0 ASSESSMENT AND RESPONSE

5.1. PROJECT DISCREPANCIES

Project discrepancies will be noted in field notes. The final report that is prepared will contain the reason for any discrepancies, and an assessment of the extent to which the discrepancies affect the usability of the data. The QAPP contains additional detail regarding documentation of project discrepancies.

6.0 DATA VALIDATION AND USABILITY

Data generated by laboratory analysis will be provided in an electronic data deliverable (EDD) as well as hard copy. The EDD will be used for data tabulation and presentation as well as data review and validation that will be presented in the investigation report. Data validation will be performed as detailed in the QAPP.

7.0 LIMITATIONS

We have prepared this Site Specific Sampling Plan for use by the Potlatch Land and Lumber, ~~LLC~~ during the removal action at the Avery Landing Site. Within the limitations of scope, schedule and budget, our services have been executed in accordance with generally accepted environmental science practices in this area at the time this report was prepared. No warranty or other conditions, express or implied, should be understood.

Any electronic form, facsimile or hard copy of the original document (email, text, table, and/or figure), if provided, and any attachments are only a copy of the original document. The original document is stored by GeoEngineers, Inc. and will serve as the official document of record.

8.0 REFERENCES

- E & E (Ecology and Environment, Inc.), "Draft Final Engineering Evaluation /Cost Analysis, Avery Landing Site, Avery, Idaho," prepared for the United States Environmental Protection Agency, Region 10, dated December 2010.
- GeoEngineers, Inc., "Draft Removal Action Work Plan, Avery Landing Site, Avery, Idaho." GEI File No. 2315-016-02, Prepared for United States Environmental Protection Agency on Behalf of the Potlatch Land and Lumber, dated [April 12](#), 2013.
- GeoEngineers, Inc., "Supplemental Site Investigation, Avery Landing Site, Avery, Idaho." GEI File No. 2315-016-01, prepared for Potlatch Forest Holdings, Inc., dated November 9, 2011.
- Golder Associates, Inc., (Golder), "Final Engineering Evaluation /Cost Analysis Work Plan for the Avery Landing Site, Avery, Idaho," Prepared for the Potlatch Forest Products Corporation, dated January 23, 2009.
- United States Environmental Protection Agency (EPA), "Guidance for Quality Assurance Project Plans, EPA QA/[RG-5](#)" publication EPA/240/R-02/009, dated December 2002.
- United States Environmental Protection Agency (EPA), "Requirements for Quality Assurance Project Plans, EPA QA/[GR-5](#)" publication EPA/240/B-01/003, dated March 2001.
- United States Environmental Protection Agency (EPA), Hazardous Waste Test Methods: Method 9095 Paint Filter Test, 2012. http://www.epa.gov/osw/hazard/testmethods/sw846/online/9_series.htm.
- United States Environmental Protection Agency (EPA), Compendiums of the Environmental Response Team's (ERT) standard operating procedures (SOPs) for sampling and analytical protocols," Environmental Response Team, Emergency Response Division, Office of Emergency and Remedial Response, OSWER Directive Nos. 9360.4-02 to 9360.4-08, dated 1991.
- Environmental Response Team Standard Operating Procedures. http://www.epaossc.org/site/site_profile.aspx?site_id=2107.